

40. Fauna of West Australia.—IV. *Palæmonetes australis*, sp. n., being the first record of the genus in Australia. By W. J. DAKIN, D.Sc., F.Z.S., Professor of Biology in the University of W. Australia.

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(Plate I.*)

INDEX.	Page
SYSTEMATIC :	
<i>Palæmonetes australis</i> , sp. n.	571

With the exception of the Phyllopoda and the crayfishes, few aquatic animals appear to have been collected and recorded from the fresh waters of Western Australia.

Among the so far unrecorded species is a prawn-like crustacean, which is extremely common in many of the rivers near Perth. What its actual range in the continent may be, remains to be discovered. The species was first found by the author in a tow-net which had been thrown at random from a river-bank and pulled back ; the net just scraped the bottom on the way. About fifteen specimens were caught in this very short, careless haul, and as the animals are pretty active in their movements they must have been present in large numbers in the water.

Since the first discovery, specimens have been obtained from several other districts. All proved on investigation to belong to the genus *Palæmonetes*. This new record marks a considerable increase in the known geographical range of this genus. So far as I can determine, only one species of *Palæmonetes* is known to occur in Europe, but that is found in Sweden, Denmark, Belgium, France, Italy, Spain, and the Black Sea. It has also been collected in the British Islands and even so far south as Egypt. This species, *Palæmonetes varians*, lives in water that is more or less brackish and close to the sea, as well as in the perfectly fresh water of lakes and rivers.

Most of the known species of the genus *Palæmonetes* appear to be American—the following having been recorded. *Palæmonetes vulgaris* (sea-water—bays and estuaries of U.S.A. coast), *Palæmonetes exilipes* Stimpson (fresh-water—U.S.A.), *P. carolinus* Stimpson (marine—U.S.A. coast), *P. argentinus* Nobili (South America), *P. kadiakensis* Rathbun (North America), *P. calceis* Rathbun (blind species found in caves in Cuba), *P. antrorum* Benedict (blind species from an artesian well in Texas), *P. eigenmanni* Hay (blind species from caves in Cuba). The Rev. T. R. R. Stebbing writes me that he has described and figured a species

* For explanation of the Plate see p. 574.

from Natal, so that South Africa has also a representative of the genus. It is surprising to find that, on the whole, there are only slight differences between the Australian species and *P. varians* from Europe or the species known from the American continent.

Habitat in West Australia.—Specimens of *P. australis* were first met with at Northam, a small town inland on the plateau, about 70 miles from the coast and at an elevation of roughly 500 feet. They were captured in the River Avon, where it breaks up into small channels below the weir. The water is of course quite fresh. The largest specimens obtained have been caught at the above place, and the animal is quite plentiful at all seasons of the year. Large-sized specimens have also been captured in Gin Gin Brook, about 50 miles north of Perth and at an elevation of roughly 300 feet. Mr. W. B. Alexander, M.A., of the West Australian museum, has placed in my hands collections captured in Bibra Lake and the Serpentine River. The lake is a small expanse of water only a foot or so deep, if that in the dry season, and is situated on the coastal plain not so very far from the sea. The habitat of these lake specimens is very different from that of the Northam examples, and there is a characteristic difference in the size of the individuals, those from the Northam River being the larger. The average length of the individuals caught at Northam is 32 mm., against 20 mm. for the Bibra Lake type.

The Serpentine River is about 34 miles south of Perth, and the specimens were caught where the river leaves the hills and enters the coastal plain. The specimens from Northam are described and figured as the type specimens of *Palæmonetes australis*.

DESCRIPTION.

Body stout. Length of largest specimens 39 mm. from end of telson to tip of rostrum, and 72 mm. to tip of outstretched antennæ. The living animals are transparent, with a prevailing amber-green tint. Brown pigment flecks occur laterally on the posterior margins of the abdominal terga, and there are sometimes two delicate longitudinal lines on the carapace somewhat laterally situated. The carapace is not quite so long as the last three abdominal segments. The sixth abdominal segment is almost twice the length of the fifth.

Rostrum.—The rostrum is long and about equal in length to the carapace, but may be very slightly longer or shorter. The tip of the rostrum exceeds the distal margin of the antennal scales. The rostrum is laterally compressed and has a pronounced curvature trending upwards towards the apex. A few small chromatophores are present. The dorsal armament consists of usually five or six teeth which are almost equally spaced along the entire length of the rostrum. This is without counting a distal tooth which forms the upper portion of the bifid apex. The most posterior dorsal tooth is well behind the orbital notch, and the next one is immediately over it. There are three or four

ventral teeth. The dorso-ventral thickness of the rostrum is not so great as that of *P. varians*.

Eyes.—The eyes are well developed and on fairly long stalks.

Antennules.—The antennules are as long as the abdomen with telson. The peduncle when extended does not attain the length of the rostrum by about one-third of the latter, and falls short of the distal margins of the antennal scales by about one-fifth the length of the scales. The shorter ramus of the outer antennule is fused to the longer for about half its length.

Antenne.—The antennal scales are large, long, and broad, and more than twice the length of the antennal peduncle minus the first segment. They are not quite so wide distally as proximally. The antennal peduncle falls short of the first segment of the peduncle of the antennule.

Mandible.—The mandibles are without palps. Incisor and molar processes are well developed and tipped as indicated in the figure.

Maxillule and Maxille.—These appendages are as figured. They possess no features of systematic importance marking them off from the similar appendages of *P. varians*.

Maxillipedes.—These are similar in structure to those of *P. varians*. The third maxillipedes when extended reach approximately to the end of the antennary peduncle.

Pereopods.—The second peræopods are the longest, and when extended they overlap the antennary scale by palms and fingers. The third peræopods are about as long as the first, the fourth a little longer, and the fifth pair are the longest of the posterior three. The first pair of pereopods attain almost the apex of the antennary scales when extended forwards. The chelæ of the second pair are shorter than the carpus, and the dactylus slightly more than two-fifths length of palm.

Telson.—The telson is longer than the preceding segment. It terminates in the mid-line with a spine. The armament consists of two pairs of stout spines and one pair of setæ. The latter are situated one on either side of the median spine. The posterior margin of the telson differs distinctly in shape from that of *P. varians*. Two pairs of spines are present on the dorsal surface of the telson.

CONCLUSION.

Palæmonetes australis occurs in the fresh-water of rivers some distance from the coast in West Australia, and is also found in shallow lakes on the coastal plain.

Females bearing eggs which have been just extruded have been captured in September (Bibra Lake), and others bearing embryos not far from the hatching stage have been collected on January 1st from Gin Gin Brook. This would indicate that the breeding season coincides with the early months of the summer—the dry season. Most of our West Australian fresh-water animals breed in the winter or spring, and many possess

drought-resisting eggs. Unfortunately, newly hatched larvæ have not yet been captured, so that we are unable to figure this stage.

The species of *Palæmonetes* known at present differ but slightly from one another, and the characters of most importance systematically which mark the Australian species are (*a*) rostrum, (*b*) rami of antennule, (*c*) length of peræopods and their segments, (*d*) telson.

EXPLANATION OF THE PLATE.

Palæmonetes australis.

- Fig. 1. Rostrum (form with seven dorsal spines). $\times 9$.
 2. Outer antennular flagellum (basal portion).
 3. Antennal scale and base of antenna. $\times 8$.
 4. Mandible. $\times 20$.
 5. First maxilla. $\times 12$.
 6. Second maxilla. $\times 12$.
 7-9. First, second, and third maxillipedes. $\times 12$.
 10. Second peræopod. $\times 7$.
 11-13. Third, fourth, and fifth peræopods. $\times 3$.
 14. Telson. $\times 12$.

41. The Keeping and Breeding of Tasmanian Devils (*Sarcophilus harrisi*). By MRS. MARY G. ROBERTS, C.M.Z.S., M.R.A.O.U.

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(Text-figure 1.)

PART I.

Until I was asked by Mr. A. S. Le Souëf, Director of the Zoological Gardens, Moore Park, New South Wales, early in 1910 to obtain, if possible, Tasmanian Tigers (*Thylacinus cynocephalus*) and Devils (*Sarcophilus harrisi*) for the London Zoological Society, I had never thought of keeping either of these animals in my collection; in fact, they were quite unknown to me except as museum specimens, although I had frequently visited remote parts of our island. I have vivid recollections, however, of how, when a young child at boarding-school in the late forties, some of the girls from Bothwell, near the Lake District, used to give graphic and terrifying accounts of the Tasmanian Devils with their double row of teeth. This belief is not yet exploded, as it was impressed upon me lately with the utmost confidence by a country visitor that such was the case; he not only believed, but said "he had seen." The teeth have been described to me by a scientist as truncated.

Shortly after hearing from Mr. Le Souëf, by means of advertising, writing, etc. I obtained three for the London Society, and having then become thoroughly interested I determined to keep some myself. Since that time a large number have passed through my hands, and more than once I have been "a woman possessed of seven devils."

In April 1911 I received a family (a mother and four young), and again in September of the same year a similar lot arrived. The former were very young, and I had the opportunity of watching their growth almost from their first appearance when partly protruding from the pouch. When sending them, the trapper wrote that "the mother was so quiet, I need not be afraid to pick her up in my arms." The little ones hung from her pouch (heads hidden in it), and she lay still and motionless as if afraid of hurting them by moving, and allowed me to stroke her head with my hand. However timid they may be, and undoubtedly they are extremely so, growling and showing their teeth when frightened, they always evince this gentleness and stillness when nursing little ones.

The skin of the young, on arrival, had the appearance of a slate-coloured kid glove, the tail darker towards the tip. The hair could be seen growing black and velvety from the head downwards, the latter being hidden in the pouch for some days,